Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-10. (cancelled)

11. (currently amended) A method for transmitting a first and a second data signal as a polarization multiplex signal in an optical transmission system, comprising:

modulating at the transmitting end the first data signal onto a first optical carrier signal and generating ~~to generate~~ a first single sideband modulated signal;

modulating at the transmitting end the second data signal onto a second optical carrier signal, which has the same optical carrier frequency or even differs by a differential frequency (Δf) from the first carrier frequency, and generating a second single sideband modulated signal such that the spectra of the first and the second sideband modulated signals overlap, by which means the transmission bandwidth is reduced~~, to generate a second sideband modulated signal~~;

orthogonally polarizing the first and the second sideband modulated signals to each other;

combining the first and the second sideband modulated signals into the optical polarization multiplex signal with overlapping orthogonal spectra including both optical carriers;

transmitting the optical polarization multiplex signal;

feeding at the receiving end the transmitted optical polarization multiplex signal via a polarization control element to a polarization splitter, which separates the optical polarization multiplex signal into the first and the second sideband modulated signals;

converting the first sideband modulated signal to a first electrical signal and converting the second sideband modulated signal to a second electrical signal;

analyzing at least one of the first and~~/or~~ the second electrical signal; and

dependent on the analyzing result, deriving at least one control signal for controlling the polarization control element.

12-13. (canceled).

14. (previously presented) The method according to Claim 11, wherein the differential frequency (Δf) is greater than one Gigahertz, whereas the carrier frequency of an upper sideband modulated signal is lower than the carrier frequency of the lower sideband modulated signal.

15. (previously presented) The method according to Claim 11, wherein the sideband modulation is a single sideband modulation or a vestigial sideband modulation.

16. (canceled).

17. (previously presented) The method according to Claim 11, wherein for a second carrier signal which differs from the first carrier signal by a differential frequency (Δf), the spectral component of the first and/or the second electrical signal at the receiver is determined at the differential frequency (Δf) for controlling a polarization control element.

18. (previously presented) The method according to Claim 14, wherein the amplitude of the first and/or the second electrical signal is controlled to a minimum at the differential frequency (Δf).

19. (previously presented) The method according to Claim 11, wherein the first or second sideband modulated signal is delayed at the transmitting end for the purpose of decorrelation.

20. (previously presented) The method according to Claim 11, wherein the first or second sideband modulated signal is delayed at the transmitting end for the purpose of decorrelation.

21-23. (canceled).

24. (previously presented) The method according to Claim 11, wherein for the purpose of distinguishing the first and second electrical signals, at least one pilot tone signal is superimposed at the transmitting end on the first and/or the second carrier signal or the sideband modulated signal.

25-27. (canceled).

28. (previously presented) The method according to Claim 11, wherein the first and second data signals are transmitted at different bit transmission rates.

29. (previously presented) The method according to Claim 11, wherein the first and second data signals are transmitted in different data formats.

30. (previously presented) The method according to Claim 11, wherein the optical transmission system is operated in wavelength multiplex mode.